

# Deployment of Urban Agriculture in east Lima, Peru

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## Abstract

Urban agriculture in Lima has been promoted by the project Farmers in the city encompassed in the Urban harvest program promoted by the Consultative Group on International Agricultural Research (CGIAR). The validation of the effectiveness of the project Farmers in the city can only be confirmed by maintenance over the time the deployment of the project goals. The project Farmers in the city was carried out by the International Potato Center (CIP) and GESPLAN research group of the Technical University of Madrid. The project was conducted at the East Cone of Lima, Peru, from 2006 to 2008. This communication shows the situation 5 years later. In order to know the current situation all the members of Cosanaca producer association, which was created under the project, have been interviewed. Besides, an expert panel was carried out with the responsible of the urban agricultural office of the municipalities that participate in the project. The results show that Cosanaca has duplicated the number of producers and that the municipalities have increased the number of workers.

*Key words: Urban agriculture; farmers' organizations; local development; local partnerships.*

## Introduction

Several definitions of urban agriculture (UA) have been exposed (Moustier and Mbaye, 1999, FAO, 1999, Veenhuizen, 2006). All definitions agree in the development of farming and/or livestock in the urban environment and the relationship between agriculture and the city in terms of resources and products. In this communication we understand that UA is when resources compete for city, been understood as an opportunity cost of human resources, surface and water (Moustier and Fall, 2004). The delimitation of the space where UA is developed has multiple definitions (FAO, 1999; Mougeot, 2001; Ramirez, 2003), but for us it is most important to understand that UA is integrated and interacts with the urban economic system (De Zeeuw 2004). The main factor that allows the interaction is public transport (Salvo et al., 2006). The urban life style reaches all the territory covered by the urban public transport network, people inside this area can move, and relate to each other according to the urban criteria and can access easily all the urban services and facilities. People outside the public transport networks are more isolated and develop the rural lifestyle.

The concept of UA is not a clearly defined concept, deals with different motivations depending on the main needs of the community that develops it: environmental (May and Rogerson, 1995; Nigel, 1998; Ruel and Haddad, 1999; Deelstra and Girardet, 2001; Cohen, 2004), social (Nugent, 2001; Honing, 2009), market (Huriot, 1994; Bon et al., 2010) or food safety approach (Wade 1981, Colasanti et al. 2000; Prain 2006, Salvo et al., 2006).

The "Urban harvest" program coordinated by the Consultative Group on International Agricultural Research (CGIAR) seeks to enhance food and nutrition security, increase incomes and improve environmental and health conditions among urban populations via agriculture. The program has been conducting research at the international level aimed at the following goals: 1) to improve the contribution of UA to the nutritional status and income generation for vulnerable families in the urban environment; 2) to increase the positive effects of UA on the environment and on human health; 3) to promote, encourage and establish policies for UA as a positive strategy for cities.

In Peru, the Urban harvest program is implementing the project "Farmers in the city", which -as part of their action plans- promotes the performance of annual events to promote the exchange of experiences in UA in Latin America and seeks sensitize organizations and institutions on the role of UA in urban development.

The Farmers in the city project was conducted at the East Cone of Lima by the International Potato Center (CIP) and the GESPLAN research group from the Projects and Rural Planning Department of the Technical University of Madrid.

This communication analyses the deployment of the project Farmers in the city after 5 years of its completion. Urban Agriculture activities deployment implies that the model described below is valid in order to generate productive activities based on UA, and to reduce the poverty in the cities.

The UA development model promoted by CIP and GESPLAN research group was based on four procedures: 1) creation of a new technical model to promote diversification and integration of urban agriculture; 2) development and maintenance of a local urban farmers network, that constitute a mass enough to assure the viability of the productive model; 3) strengthening of institutional linkages in support of urban agriculture; 4) acknowledgment and valorisation of Urban Agriculture environmental services by local actors.

This communication begins by the definition of the study area, the conceptual framework of the project, work methodology approach and the explanation of the methods used. An analysis of the labour force, certification system, irrigation type and selling of Cosanaca members producers association, which was created under the project, is presented. Followed by the information collected on an expert panel information with those responsible of the urban agricultural office of the municipalities which participates in the project. The communication discusses the lesson learned from the project and finally the research concludes with the main results.

## Methodology

**Study area** Lima is the second largest desert city in the world. Currently the conurbation formed by Lima metropolitan region and Callao province hosts more than 9 million people occupying 505 km<sup>2</sup> on a strip of 80 km length of the Peruvian coast. Lima was established in the confluence of the rivers Chillón, Rimac and Lurín; north, south and east

respectively; which form a large agricultural valley in the middle of the desert. The development of this megalopolis occupied large areas of agricultural land. Currently remain agricultural areas in unoccupied areas along the lower course of the rivers.

The area of study is located in the Municipality of Lurigancho-Chosica within the East Cone of Lima, located in the Rimac river basin. Lurigancho-Chosica is one of the largest and least urbanized municipalities of the Province of Lima (Castro and Juarez, 2007). And almost the 50% of the 980000 inhabitants are poor (Raymundo, Bussink and Prain 2007). The agricultural land is about half of the area where coexist a wide variety of agricultural, industrial and commercial activities. The area covered by the project includes 5,713 inhabitants and 1,245 families distributed in four towns. The living conditions of citizens are extremely poor, where 98% of households lack potable water, 50% did not have its own light and only 40% of them live in houses of noble materials (Castro and Juarez, 2007).

**Methodology** This study develops a mid-term sustainability analysis through the consideration of the situation of the main project outcomes some time after (five years in this case) the ending of the project.

There have been contacted the project beneficiaries (urban farmers) and other relevant local stakeholders (Municipality and farmers' association) to describe their activity and relate it to the future situation planned at the project inception. To obtain those data a research team has displaced to the city of Lima and has interviewed them face to face, visiting the same locations where the project activities were developed.

The interviews with the farmers of Cosanaca producers association followed the list below:

- a) What is the area under cultivation in 2008? And in 2013?
- b) How many employees works in 2013? Distinguishing self-employed full-time and part-time and external employees full-time and part-time.
- c) What organic certification system has the farm?
- d) What irrigation system uses the farm?

The script of questions followed with the leaders of the association of producers, differing in each response data for 2008 and 2013 was as follows:

- e) How many points of sale sell Cosanaca?
- f) What is the net profit per producer weekly at each point of sale?
- g) How many farmers participate weekly at each point of sale?

In the expert panel with the the responsible of the urban agricultural office of the municipalities that participate in the project followings topics were discussed:

- h) Numbers of employees in the urban agriculture office of the municipality
- i) Relations and networks with others municipalities and organizations
- j) Activities and regulations carried out from 2008.

**Conceptual framework** In the study area the CIP, made several previous studies of technical social and market topics which identified a number of features that led to the implementation of a program of cooperation based on the integration of urban and peri-urban agriculture and sustainable development of local governments (Prain, 2006).

The project developed initially a baseline analysis to better undertake the local vegetables market in Lima. There were also analysed other previous strategies for the promotion of urban agriculture developed at other capital cities in Latin America. After that was decided that the most suitable methodological approach was a Multi-stakeholder approach, based on the integrated development of beneficiaries competences (technical, behavioral and contextual).

The sustainable development could not been achieved only by promoting a new farming system based on the diversification of production through integrated organic farming systems (technical approach). There were also needed to promote the empowerment of local farmers (behavioral approach) to make them able to assume the marketing and promotion activities that allows them to advance steps at the local market value chains and to retain a greater percentage of the final product worth. Finally there was also needed conscientiousness of the political stakeholders and creating linkages with other NGOs and local associations (contextual approach) in favor of urban agriculture.

The project was financed by CIP own funding and Madrid city council funding. The project was supported by the Regional and Metropolitan Government of Lima, the District Municipality of Lurigancho-Chosica and the Municipality of Santa Maria Town Center Huachipa and other local partners such as the communities of Huachipa, Carapongo, Nievería, Ñaña and Jicamarca and NGOs: Nutrition Research Institute (IIN) and CESAL.

To achieve the general objective of reducing urban poverty and improve food security and nutrition, the project was focused on strengthening municipal governments through the implementation of a culture of sustainable local development planning following the WWP approach (Cazorla *et al.* 2013). The Farmers in the city project expected six outcomes corresponding to others areas for action (Salvo *et al.* 2006):

- Empowering People, which accorded the target population (urban farmers) and municipal managers should be trained, sensitized and involved in the project
- Strengthening institutions, whose aim was to strengthen and organise local institutions and municipal governments, producers, irrigation boards, homeowners associations, etc., defining a system of urban management partnership between regional and local governments
- Social development, considered as an essential complement of economic development, aimed at improving human development through social and environmental programs in municipalities and local organizations

- Micro-investments revolving fund, intended to boost productivity and marketing of agricultural products through a revolving fund
- Planning, monitoring and evaluation
- Transfer of results and expansion to other municipalities,

The operative tools created to implement the model under the project Farmers in the city were:

- 1) creation of a new technical model to promote diversification and integration of urban agriculture: **Urban farmers' school (UFS)**. A 1,500 m<sup>2</sup> farm implemented by the project to demonstrate the new production model. Interested farmers joined at the school twice a week and worked growing during all the culture cycle. Every day they completed the agriculture training with some organizational activities to develop an UA producers' organization in order to help local farmers to acquire organizational abilities to make them able to manage organization by themselves.
- 2) development and maintenance of a local urban farmers network, that constitute a mass enough to assure the viability of the productive model: **Urban farmers producers associations**. As the result of the UFS. The association allow to small farmers sell their products directly to final consumers..
- 3) strengthening of institutional linkages in support of urban agriculture: **Urban agriculture office**. The Municipality of Lurigancho-Chosica established a UA office in order to help the UA development.
- 4) acknowledgment and valorisation of Urban Agriculture environmental services by local actors. **Organic certification of UA farms and products**. The original environmental approach was transformed into a marketing strategy that helped the farmers to obtain a space in the local food market of the city of Lima. The farmers, who participated at the UFS, certified their farms as organic through a commercial external certifier enterprise (that followed the European Union organic certification procedure). This certification distinguished their production allowing them to achieve better marketing opportunities.

### Results. Situation in 2013

**COSANACA producers' association.** This producers' association Works as a service company charged on the marketing of the vegetables produced by the association members. Cosanaca was founded by seven farmers trained at the UFS at the end of year 2007 and by the end of the project in December 2008 was integrated by 9 members. Actually it is integrated by 18 farmers, and is training other three new members. Since the end of the project until present, as is shown at table 1, the surface under production has been increase almost four times and the number of member integrated at the association has been doubled. Besides, production has been increased in the same proportion as surface because farmers have to keep their plots under organic production to start the certification procedure.

The certification process has also evolved. The Peruvian organic farming national association created the Participatory Guaranty Certification System (SGP, according to the name in Spanish). This certification procedure has been accepted by Peruvian authorities to allow farmers to sell their products at local markets, but not at the supermarkets that apply the most restrictive certification procedures which are equal to those applied for agro-food exportations to Europe, this kind of certification is defined in this paper as "External".

Table 1. Farming surface, labor force, certification system and irrigation water for COSANACA members

Producer	Surface (m <sup>2</sup> )		members				Certification system*	Irrigation water
			Labour force at 2013					
	2008	2013	Self employment		External employees			
			Full time	Part time	Full time	Part time		
Urban farmer 1	2,000	6,000	1	0	0	2	External	Channel
Urban farmer 2	1,500	5,000	1	2	2	0	External	Well 1
Urban farmer 3	1,500	5,000	1	0	1	1	SGP	Well
Urban farmer 4	1,500	4,500	1	0	1	2	External	Channel
Urban farmer 5	2,000	3,500	1	0	1	1	External	Well and Channel
Urban farmer 6	1,000	3,000	1	1	0	0	External	Channel with treatment
Urban farmer 7	400	1,200	1	0	0	0	External	Channel
Urban farmer 8	400	3,000	1	0	1	0	SGP	Channel
Urban farmer 9	-	2,000	1	2	0	0	SGP	Channel
Urban farmer 10	-	1,000	1	1	0	1	SGP	Channel
Urban farmer 11	-	1,000	1	0	0	0	SGP	Channel
Urban farmer 12	-	1,000	1	0	0	0	SGP	Channel
Urban farmer 13	-	1,000	1	0	0	0	SGP	Channel
Urban farmer 14	-	1,000	1	0	0	0	SGP	Channel
Urban farmer 15	-	1,000	1	0	0	0	SGP	Channel
Urban farmer 16	500	500	1	0	0	0	External	Channel
Urban farmer 17	-	500	1	0	0	0	SGP	Channel
Urban farmer 18	-	500	1	0	0	0	SGP	Channel
Total	10,800	40,700	18	6	6	7		

Source: Authors (\*SGP: Participatory Guaranty Certification System)

At the end of 2008 Cosanaca has one selling agreement with the NGO Ecológica Peru, which is a non-profit intermediate trader whose mission is to promote the ecological culture. EcológicaPerú has a self trade mark and an agreement with the two main supermarkets chains of Peru to distribute ecological foods at their supermarkets. As can be seen at table 2 selling have also been significantly increased during the period.

In the middle of a process of diminution of the agricultural labour force COSANACA farmers adopted a farming system that is more demanding of labour in global terms. This is an advantage thanks to the organic diversification of their farms. The demand of labour is low in the traditional monoculture agriculture practice. But it needs several employees concentrated at a few days for certain farming activities. However at the organic system with more than ten different cultures at the same farm the global demand of labours is bigger. The farmers at the beginning of the activity consolidated their self employment.

Table 2. Evolution of vegetables selling

Selling points Market	Weekly deliveries		Net benefits €/person-week		Farmers participation per week/total farmers	
	2008	2013	2008	2013	2008	2013
EcológicaPerú	3	5	80	350	6 / 6	7 / 7
Vegetarian restaurants	3	3	120	150	2 / 6	2 / 7
La Molina organic fair	0	1	0	120	0	3 / 18
Surquillo organic fair	0	1	0	80	0	4 / 18

Source: Authors

Besides the self employment during the deployment process, the increase of the certified agricultural area has generated additional employment. Six relatives of the farmers cooperate partially at the production and actually there are other 6 full time external employees and 7 part time external employees.

The single production factor that has not evolved during this period has been the irrigation water. For the local conditions of the East Cone of Lima surface water from the channels of Rimac river does not fulfil the minimum conditions to be accepted for the organic certification consultants, due to the biological pollution. There is needed to use water from wells. That is the reason that the new members who does not have this resource at their farms cannot access to the External certification. At Table 1 there can be appreciated that there are four externally certified members that does not have wells, but they are in a transition period in which they should improve their irrigation systems, if not they will lose their certification.

As in the case of the surface under production, and labour force, selling points has increased from two to four, and weekly deliveries has increased from 6 to 10 (see Table 2). In the same way the net benefits per person and week has been increased in all the selling points. Not all producers sell their products every week. Cosanaca has established an effective system of rotations that stagger crops so that all members regularly sell their products in the four selling points. However not all the producer can sell their products in all the selling points. Only the producers with the organic External certification can sell to Ecológica Perú and to vegetarian restaurants.

The COSANACA producer association maintained the UFS training their new members with the same methodology, has increased the commercialization activity and has enhanced new dissemination of activities through their collaboration with the Lima City Municipality

**Urban agriculture office.** The second deployment result is the urban agriculture office from the Municipality of Lurigancho-Chosica. At the end of 2008 it was managed by a single employee without specific technical training. Her mission was mainly to coordinate with the Urban Agriculture Technical team and with local farmers. But at the end of year 2010 the Urban Agriculture municipal staff was enhanced. Actually the office is composed by two agronomical engineers and one technical assistant.

The Urban Agriculture municipal office has assumed the task of concluding the process initiated by the project of writing and publishing the local regulations for UA. The pigs breeding regulation has already been published and they are working at the small animals breeding and horticulture regulations. According to the positive experience developed during the project period, they continue working in a participatory way working with the related urban farmer and breeders.

At the end of 2008 the project

## Discussion

The lesson learned from the project was the need to train farmers, and involve the municipality to make the project sustainable.

The producers' organization has increased the number of members and the selling. Farmers' average income is bigger than other alternative urban activities salaries and this is the main reason for the sustainability of the production model. In a context of decreasing of agricultural labour force there has been consolidate the self employment and there has been created new external permanent employs. The model has also generates 6 family par time and 7 external employees, that could be transformed in permanent employees in the future.

Organic production was a successful strategy to develop the urban vegetables production because it was fully integrated with the marketing strategy. The success of this marketing strategy was based on the wide diversity of

vegetables produces almost continuously. That allowed local farmers' organization to sell directly to the final consumers because they were able to cover all their vegetables needs with a single delivery.

The main activity was helping local farmers to acquire organizational abilities to make them able to manage the urban farmers' organization by themselves. The research shows that the integrated commercialization by a group of more than 10 farmers and that the diversification of the vegetables production according to the ecological models allows farmers to obtain benefits weekly, equally to the rest of their non-farming neighbours. The UA offers a way of living similar to other alternative urban activities.

The scaling-up of the model shows that different groups of beneficiaries demand different organizations and market approaches. Several groups selected a self consumption, non commercial model. COSANACA focussed successfully on the commercial approach, demonstrating the viability of the market approach initially proposed. Once integrated in the Regional Association of Organic Producers of Lima contacted many municipalities at the region of Lima to set up organic markets, and developed pilot activities at the Municipalities of San Isidro, Miraflores Surco and La Molina. The most successful experience was La Molina where there remains the Sunday fair until present.

The general idea at the beginning and the execution of the project was that the most relevant actor for the project sustainability was the Municipality and their urban agriculture office. However, five year later, results show that the most relevant actor has been the producers' organizations. COSANACA producer association, which maintained the UFS training their new members with the same methodology, has increased the commercialization activity and has enhanced new dissemination of activities through their collaboration with the Lima City Municipality. The successful experience has called the attention of the Lima metropolitan Municipality, who have called the farmers from East Cone of Lima to be involved at the training activities that is going to develop at other districts of Lima. Thus the scaling-up process has been recovered by this new alliance.

## Conclusion

The validation of the effectiveness of the process launched with the project Farmers in the City can only be confirmed with the perspective of time. The most usual practice regarding to the development projects result assessment is to validate them at the closing of the project, when the supporting activities are just finished, but there is no usual to evaluate the results some years after that moment.

When the support has just finished is easy to obtain positive results because the effects of the direct investments are still present at the territories, and local actors are usually thanked to the received support. But the real development can only be confirmed through the confirmation of the maintenance on time of the development results desired by the project formulation team, and its evolution.

There are three main results that allow verifying the sustainability and evolution of the results achieved at the end of the project five years later, in a process that we have denominated deployment of UA after the project: 1) The evolution of the producers' association; 2) the maintenance of the Urban Agriculture municipal office; 3) the scaling up of the model. Future interventions at the same local context should be based on these three strengths.

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